

GENERAL INSECT MORPHOLOGY

Lab 13 - A study of the male and female reproductive systems of the grasshopper

A. Female Reproductive System

Dissection. Obtain a female specimen of the grasshopper. Remove the legs and wings. Carefully make a longitudinal cut on each side of the abdomen just a little bit dorsal to the longitudinal suture. Connect the two longitudinal cuts by making a transverse cut across the first abdominal tergum. Place the specimen in the dissecting dish and anchor the specimen by placing a pin through the thorax. Carefully peel back the dorsal part of the abdomen and pin it out behind the specimen. Pin the sides of the abdomen. Gently tease or pull the ovaries away from the midline of the body to reveal the alimentary canal. Cut the anterior end of the alimentary canal and pull it posteriorly until you can see where it exits the body at the anus. Cut the alimentary canal near the anus and remove. You may now be able to see the ventral nerve cord running along the ventral midline. Follow it posteriorly. The last abdominal ganglion lies on top of the genital chamber so it will need to be removed. Locate the lateral oviducts leaving the ovaries. They should be leading in a mesial direction towards the genital chamber. There may be a small longitudinal muscle on each side on top of each lateral oviduct. This muscle activates the ovipositor and should be carefully removed. Remove any fat tissue and tracheae that obscure the genital chamber [CAUTION: THE SPERMATHECA WILL BE A SAC-LIKE CONNECTING TO THE GENITAL CHAMBER BY A CONVOLUTED SPERMATHECAL DUCT FROM THE TOP - DO NOT REMOVE].

Structures. The ovaries will be so full of eggs it will be nearly impossible to delineate the actual ovarioles or their terminal filaments. If you look carefully you may be able to see the individual pedicels entering the enlarged distal area of the lateral oviduct called the calyx. In the cricket there is no median oviduct outside of the genital chamber or bursa copulatrix; that is, the lateral oviducts enter directly into the genital chamber which is a dilated sac-like structure near the base of the ovipositor. The spermatheca is also a sac-like structure connected to the genital chamber by a convoluted spermathecal duct. There are no accessory glands in the cricket.

Prepare a drawing of the dorsal view of the female internal reproductive organs of the grasshopper, labeling the above underlined structures.

B. Male Reproductive System

Dissection. Begin the dissection the same as you did for the female. Once you have made the cuts in the abdominal wall and the specimen properly pinned out you should be ready to locate the reproductive structures. The large ovoid whitish structures located laterally on each side of the body are the testes. Once again carefully remove the alimentary canal in same manner as for the female. From the posterior surface of each testis will arise the vas deferens. This will be a very small and long duct which will eventually lead to the median duct. The actual median duct will be covered with numerous accessory glands. Notice that the accessory glands near the median are shorter and smaller than those more laterally. Remove any extraneous fat tissue and tracheae. Once again there are nerves crossing the vas deferens that will have to be removed. Carefully follow the vas deferens to the median duct. As it nears the median duct it will become obscured by the accessory glands which you may need to try to remove. Also as the vas deferens nears the median duct it becomes enlarged and convoluted forming the seminal vesicle. Between the seminal vesicle and the median duct the vas deferens becomes small again for a short distance. As the median duct leads posteriorly it becomes somewhat narrower until it reaches the gonopore. Near the gonopore there are two small round ejaculatory vesicles which open into the duct. Also at the posterior end of the duct and dorsal to it is a larger structure called the dorsal pouch where the spermatophore is formed.

Prepare a drawing of the dorsal view of the male internal reproductive system of the grasshopper, and label the above underlined structures.